



Series **400**

MULTI-CHANNEL PULSE HEIGHT ANALYZERS

TECHNICAL MEASUREMENT CORPORATION

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Outstanding features, performance, and reliability are built into all Series 400 Pulse Height Analyzers and Series 500 Data Processing Units.

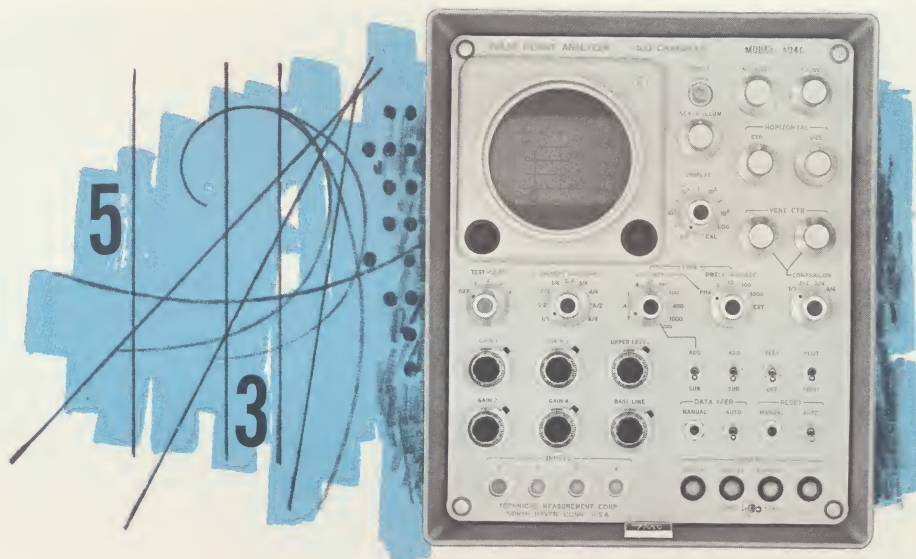
A truly portable, compact design has been achieved. Unit side covers are easily removed to allow quick testing or exchange of plug-in type printed circuit cards.

Low power requirements and small size make these units ideal for use in laboratories where space is a premium or in airborne, mobile, and shipboard installations. A compatible D.C. to A.C. converter is available as an accessory for operation from direct current power sources.



Series 400

PULSE HEIGHT ANALYZERS



The Series 400 Pulse Height Analyzers are used in applications requiring a qualitative and quantitative analysis of nuclear radiation. These instruments are widely used for gamma scintillation spectrometry and alpha, beta, and neutron measurements when appropriate detectors and preamplifiers are employed.

Analysis is accomplished by sorting pulses from an appropriate radiation detector on an amplitude basis, or on a pulse number per time increment basis. These methods are used in the two principal modes of operation for Series 400 Analyzers. A third mode, Mössbauer Effect Analysis, is provided in the Model 401CM.

In the Pulse Height Analysis Mode, pulses are sorted into a selected number of channels (memory addresses) that are unit measurements of amplitude directly proportional to radiation energy. The number of pulses sorted

into each channel provides a record of the characteristic energy distribution or "spectrum."

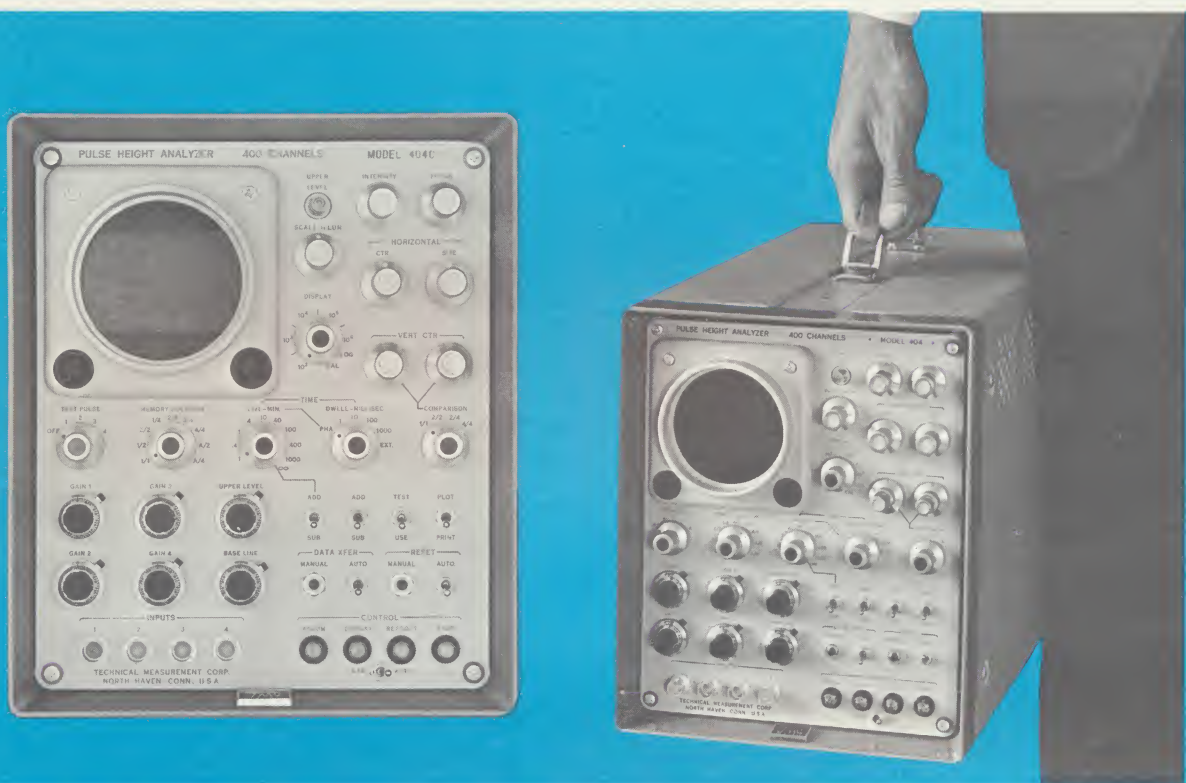
The Multiscaler Mode is comparable to counting pulses in a series of scalers that open and close consecutively during calibrated time intervals. This mode is used primarily in decay-time measurements of radioisotopes with extremely short half lives. Other experiments involving gross counting can also be accomplished.

In the Mössbauer Mode, it is possible to sort pulses according to their instantaneous velocity. An external generator is used to provide a constant-velocity reference.

The characteristic energy distribution spectrum can be generated in analog form and displayed on a built-in cathode ray tube. Data can also be processed or read out with accessory equipment.

Model 404C

PULSE HEIGHT ANALYZER



The Model 404C Pulse Height Analyzer can accept up to four inputs simultaneously without the need for auxiliary equipment or routing signals. Four internal low-level amplifiers and a built-in mixer circuit permit direct connection to detector-preamplifiers such as the TMC DS-13.

Data derived from each input is stored in a separate quarter of the memory. Analysis is performed on a "first-come, first-served" basis

so that the single analog-to-digital converter can, in effect, perform four analyses at one time.

Input signal pulses from external amplifiers, such as the solid-state double delay line types currently in use, can also be accepted when high-level inverter cards are used. High level amplifiers are also compatible when in-line attenuators are used in conjunction with high level inverter cards.

MODEL 404C ANALYZER SPECIFICATIONS

GENERAL

Number of Channels

400.

Count Capacity per Channel

$10^6 \cdot 1$.

Number of Signal Inputs

Four.

Operating Modes

Pulse Height Analysis.
Multiscaler.

Display

Linear or logarithmic on a built-in cathode-ray tube.

Live: observation of data during accumulation.

Static: observation of data stored in the memory.

Channel Groups

Four groups of 100 channels each, two groups of 200 channels each, or one group of 400 channels. Live time is stored in the first channel of the group being used.

Digital Readout Form

Parallel BCD digits in sequence or in full parallel form for Address and Arithmetic data.

Analog Readout Form

Address and Arithmetic analog voltages for X-Y Recorder or external display.

Address (X) = 0-400 mv, variable.

Arithmetic (Y) = 0-100 mv, variable.

Programming Capability

The analyzer can be programmed to accumulate, transfer data, readout, and display automatically.

Data Transfer

Bi-directional manual or automatic transfer from one half to the other half, or from one quarter to another quarter within the same half. Data can also be transferred automatically during readout.

PULSE HEIGHT ANALYSIS SECTION

Low-Level Signal Requirements**Amplitude**

0 to 50 millivolts, at maximum gain settings.

Polarity

Negative.

Rise Time

0.3 microsecond, approximately.

Fall Time

1 to 3 microseconds.

Pulse Duration

Not less than approximately 1.0 microsecond at 90% rise and 10% fall amplitude points.

High-Level Signal Requirements**Amplitude**

0 to 10 volts (0 to 100 volts with a special attenuator).

Polarity

Positive.

Rise Time

0.3 microsecond, approximately.

Fall Time

1 to 3 microseconds.

Pulse Duration

Not less than approximately 1.0 microsecond at 90% rise and 10% fall amplitude points.

Input Impedance

500 ohms. 4000 ohms when an in-line attenuator is used in conjunction with a high-level inverter circuit.

Preset Live Times

0.1, 0.4, 1, 4, 10, 40, 100, 400 and 1000 minutes, or infinity, switch selectable. Live time is automatically printed out, and can also be added or subtracted.

Tolerance to High Count Rates

Up to 50,000 pps, with less than 1% shift.

MODEL 404C ANALYZER SPECIFICATIONS (cont'd.)

Gating Signal, Coincidence or Anti-Coincidence Requirements

Amplitude

4 volts.

Polarity

Positive.

Rise Time

0.1 to 0.3 microsecond, approximately.

The gating signal must precede the input signal by 0.25 to 1.0 microsecond.

Linearity**Integral**

$\pm 0.5\%$ over top 97% of full scale.

Differential

$\pm 2.0\%$ over top 97% of full scale.

Dead Time

$39 + 0.2N$ microseconds for 400 channels.

$39 + 0.4N$ microseconds for 200 channels.

$39 + 0.8N$ microseconds for 100 channels.

(39 microseconds is the memory cycle time, and N is the channel number.)

MULTISCALER

The analyzer will count input pulses in one channel for a preset dwell time and automatically advance to succeeding channels at the end of the preset time.

Dwell Time

Variable between 1, 10, 100 and 1000 milliseconds. Can also be varied by EXT. Dwell Time source.

Dead Time

32 microseconds.

Pulse Pair Resolution

8 microseconds.

DIGITAL COMPUTER SECTION

Storage Device (Memory)

Coincident current magnetic-core type.

Memory Access

Parallel, random, 24 bits per channel.

Storage Form

Binary-Coded Decimal.

Add/Subtract Logic

Data can be accumulated with positive or negative sign for algebraic summation.

POWER REQUIREMENTS

36 watts at 100, 115, 200, 215 or 230 volts, 50-400 cps.

MECHANICAL

Size

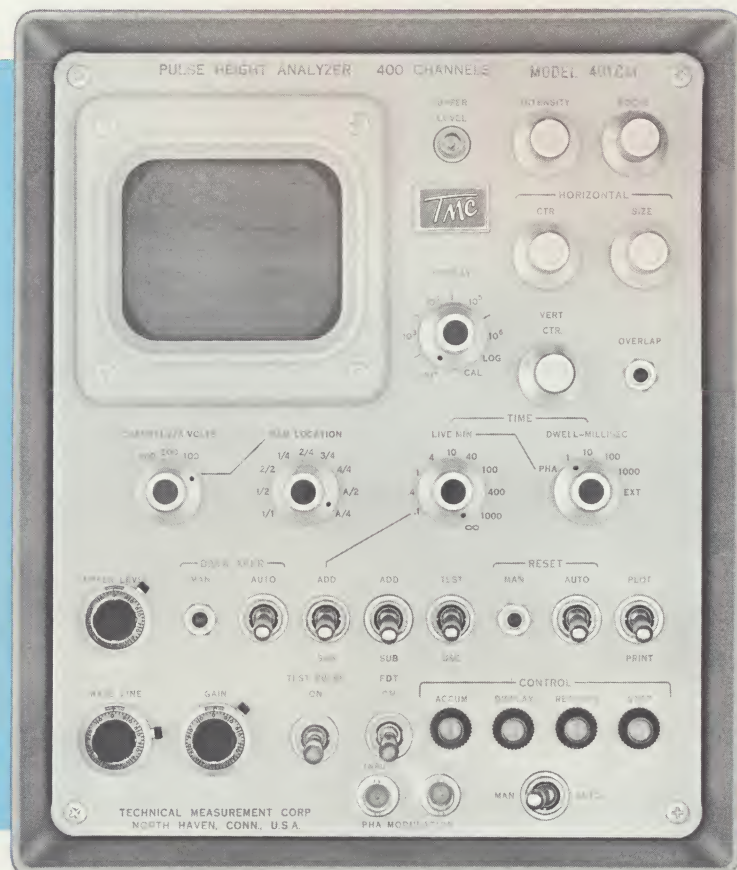
8 $\frac{5}{8}$ " w x 10 $\frac{1}{4}$ " h x 21" l

Weight

37 pounds.

Model 401C AND 401CM

PULSE HEIGHT ANALYZERS



The Model 401C Pulse Height Analyzer contains one input and incorporates many of the fine features of the Model 404C. A conversion gain control allows a spectrum to be sorted, without any change in calibration, into either one quarter of the memory (100 channels), one half of the memory (200 channels), or the whole memory (400 channels). The experimenter can also mix signals from as many as four preamplifiers and route them to various memory sub-groups by means of auxiliary apparatus and coincidence routing inputs.

In addition to Pulse Height Analysis and Multiscaler Operation, the Model 401CM has provision for Mössbauer Effect Analysis. A

modulating signal of known velocity is connected to one input. Triggering pulses from the detector are applied at a second input. These triggering pulses allow counts, proportional to the instantaneous amplitude of the modulating signal, to be added to a corresponding channel. In this way pulses are sorted according to their instantaneous velocity.

Because the dead time of the system varies according to the channel into which the pulse count is added, a Fixed Dead Time Switch is provided to compensate for this difference. This means that no calculation for dead time compensation is required.

MODEL 401C & 401CM PULSE HEIGHT ANALYZER SPECIFICATIONS

GENERAL

Number of Channels
400.

Count Capacity per Channel
 $10^6 \cdot 1$.

Number of Signal Inputs
Model 401
One.

Model 401M
Two, one for velocity and one for trigger, pulse height analysis, or multiscaling.

Operating Modes
Model 401
Pulse Height Analysis.
Multiscaler.

Model 401M
Pulse Height Analysis.
Multiscaler.
Mössbauer Effect.

Display
Linear or logarithmic on a built-in cathode-ray tube.
Live: observation of data during accumulation.
Static: observation of data stored in the memory.

Channel Groups

Four groups of 100 channels each, two groups of 200 channels each, or one group of 400 channels. Live time is stored in the first channel of the group being used.

Digital Readout Form

Parallel BCD digits in sequence or in full parallel form for Address and Arithmetic data.

Analog Readout Form

Address and Arithmetic analog voltages for X-Y Recorder or external display.

Address (X) = 0-400 mv, variable.
Arithmetic (Y) = 0-100 mv, variable.

Programming Capability

The analyzer can be programmed to accumulate, transfer data, readout, and display automatically.

Data Transfer

Bi-directional manual or automatic transfer from one half to the other half, or from one quarter to another quarter within the same half. Data can also be transferred automatically during readout.

PULSE HEIGHT ANALYSIS SECTION

Low-Level Signal Requirements

Amplitude
0 to 50 millivolts, at maximum gain settings.

Polarity
Negative.

Rise Time
0.3 microsecond, approximately.

Fall Time

1 to 3 microseconds.

Pulse Duration

Not less than approximately 1.0 microsecond at 90% rise and 10% fall amplitude points.

High-Level Signal Requirements

Amplitude
0 to 10 volts (0 to 100 volts with a special attenuator).

MODEL 401C & 401CM PULSE HEIGHT ANALYZER SPECIFICATIONS (cont'd.)

Polarity

Positive.

Rise Time

0.3 microsecond, approximately.

Fall Time

1 to 3 microseconds.

Pulse Duration

Not less than approximately 1.0 microsecond at 90% rise and 10% fall amplitude points.

Input Impedance

500 ohms. 4000 ohms when an in-line attenuator is used in conjunction with a high-level inverter circuit.

Preset Live Times

0.1, 0.4, 1, 4, 10, 40, 100, 400 and 1000 minutes, or infinity, switch selectable. Live time is automatically printed out, and can also be added or subtracted.

Tolerance to High Count Rates

Up to 50,000 pps, with less than 1% shift.

Gating Signal, Coincidence or Anti-Coincidence Requirements

Amplitude

4 volts.

Polarity

Positive.

Rise Time

0.1 to 0.3 microsecond, approximately.

The gating signal must precede the input signal by 0.25 to 1.0 microsecond.

Linearity

Integral

$\pm 0.5\%$ over top 97% of full scale.

Differential

$\pm 2.0\%$ over top 97% of full scale.

Dead Time

$39 + 0.2N$ microseconds for 400 channels.

$39 + 0.4N$ microseconds for 200 channels.

$39 + 0.8N$ microseconds for 100 channels.

(39 microseconds is the memory cycle time, and N is the channel number.)

MULTISCALER

The analyzer will count input pulses in one channel for a preset dwell time and automatically advance to succeeding channels at the end of the preset time.

Dwell Time

Variable between 1, 10, 100 and 1000 milliseconds. 10-second dwell-time is optional. Can also be varied by EXT. Dwell Time source.

Dead Time

32 microseconds.

Pulse Pair Resolution

8 microseconds.

MODEL 401M ONLY — MÖSSBAUER EFFECT ANALYSIS SECTION

Modulation Input Signal Requirements:

Frequency

Square wave: up to 1 kilocycle per second.
Sine wave: up to 10 kilocycles per second.

Amplitude

4.5 volts peak-to-peak for maximum channel selection.

Trigger Input Signal

Same as Low Level PHA Input requirements.

DIGITAL COMPUTER SECTION

Storage Device (Memory)

Coincident current magnetic-core type.

Memory Access

Parallel, random, 24 bits per channel.

Storage Form

Binary-Coded Decimal.

Add/Subtract Logic

Data can be accumulated with positive or negative sign for algebraic summation.

POWER REQUIREMENTS

36 watts at 100, 115, 200, 215, or 230 volts, 50-400 cps.

MECHANICAL

Size

8 $\frac{5}{8}$ " w x 10 $\frac{1}{4}$ " h x 21" l

Weight

37 pounds.

The 500 Series

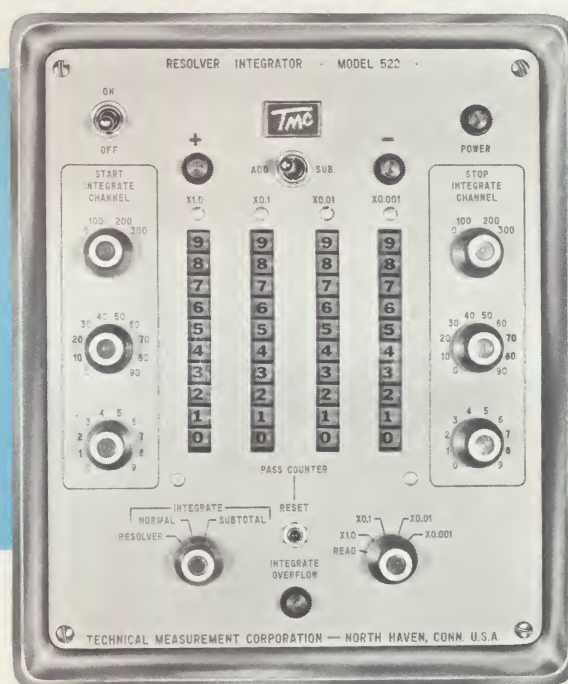
DATA PROCESSING UNITS

The 500 Series Data Processing Units, when used with the Series 400 Pulse Height Analyzers, allow readout of data on typewriter, printer, or paper tape punch, and read-in of data from a paper tape reader. Many of these operations can be performed simultaneously, such as read-type operation from a

paper tape reader, while accumulating new data in the analyzer.

Accessibility to components is made easy by the use of plug-in type printed circuit cards. The most advanced techniques are used in these compact units to ensure reliability.

Model 522 RESOLVER/INTEGRATOR

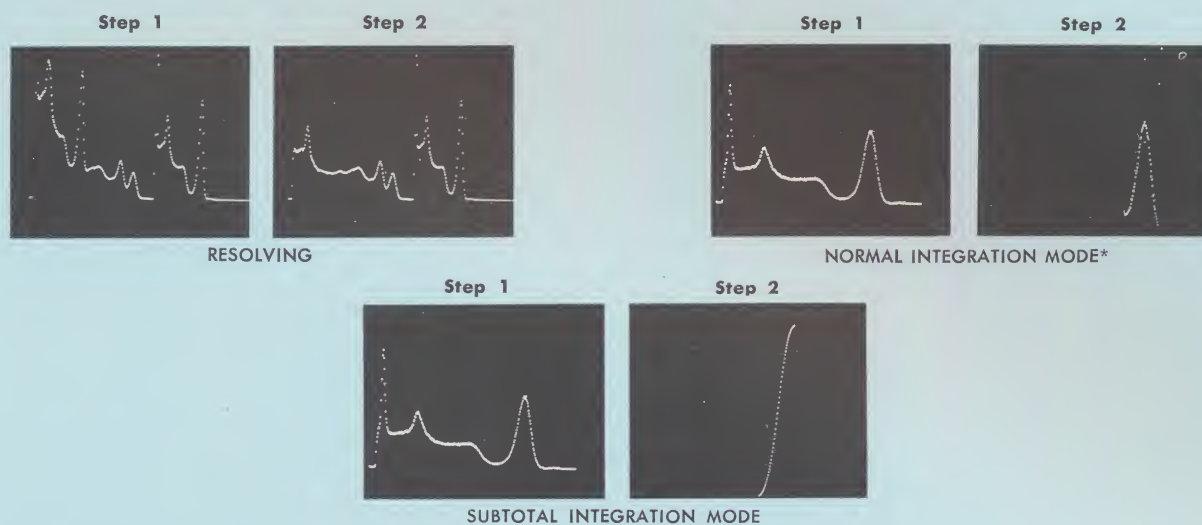


Data reduction capabilities of the Series 400 Analyzers are extended with the Model 522 Resolver/Integrator. When operated as a Resolver, information stored in a selected quarter or half of the analyzer memory can be easily subtracted from, or added to, information stored in an adjacent quarter or half. By accumulating or reading in reference spectra, the individual components of a complex spectrum can be removed, leaving only the information of interest. The percentage of information to be subtracted or added is selected to allow precise control of the process. Reference data is retained by the analyzer

to allow an unlimited number of resolving operations.

Integration of data within any selected band of channels can also be performed. Two integration modes are provided: Normal and Subtotal. In the Normal mode, the selected band is totaled at the end of the integration cycle; the integrated total replaces the information previously stored in the STOP INTEGRATE CHANNEL. In the Subtotal mode, each count is added to the previous one, providing a running total; the subtotals replace information previously stored in those channels.

TYPICAL DISPLAYS, MODEL 522



* Only the photo peak has been integrated.

MODEL 522 SPECIFICATIONS

RESOLVER

Resolving rate

0.5 second for one addition or subtraction operation on 100 channels. 1.0 second for one addition or subtraction operation on 200 channels.

Percent Resolved

100%, 10%, 1% or 0.1%.

INTEGRATOR

Integration rate

0.5 second per quarter memory.

Channel band

Continuous — 1 to 400 channels.

Modes

Normal; subtotal.

Blanking

Only channels to be integrated are visible on Analyzer CRT Display.

POWER REQUIREMENTS

19 watts at 100, 115, 200, 215 or 230 volts, 50-400 cps.

MECHANICAL

Size

8 $\frac{5}{8}$ " w x 10 $\frac{1}{4}$ " h x 21" l

Weight

28 lbs.

Model 520

TYPE-PUNCH-READ CONTROL UNIT



MODEL 520P

MODEL 520

520 SPECIFICATIONS

OPERATING SPEED

Punch Readout Operation

60 characters per second.

Type Readout Operation

10 characters per second.

Type-Punch Readout Operation

10 characters per second.

Read-in Operation

60 characters per second.

Read-Type Operation

10 characters per second.

DATA ENTRY

Parallel BCD digits in sequence from a Series 400 Analyzer.

EXTERNAL PUNCH IDENTIFICATION NUMBER

A maximum of 3 digits may be inserted.

This versatile, easy-to-operate unit provides maximum utilization of all three data-handling devices. The Model 520 Type-Punch-Read Control Unit permits operation of a computer typewriter, Paper Tape Punch, and Paper Tape Reader with Series 400 Pulse Height Analyzers.

Data stored in the analyzer can be typed and/or punched out without interruption, while at the same time data from a previously punched paper tape is being read into the analyzer. Reading out or reading in can be performed individually or simultaneously.

Independent read-type operation is another important feature. This makes it possible to read back a punched tape to the typewriter for copy while the analyzer is reading out on punched tape at high speed or accumulating new data.

A code that allows processing of punched tape by IBM type-to-card is used in the Model 520; other codes are available upon request.

MANUAL PUNCH OPERATION

Tape Punch may be operated manually with front panel controls of the Model 520.

EXTERNAL PUNCH OPERATION

Tape Punch may be operated with external information and trigger signals.

ADDRESS IDENTIFICATION

Identification of every address location or every tenth address location is selected by a front panel control (Typewriter mode only).

POWER REQUIREMENTS

15 watts at 100, 115, 200, 215, or 230 vac, 50-60 cps. (Quiescent Condition).

MECHANICAL

Size

8 $\frac{5}{8}$ " w x 10 $\frac{1}{4}$ " h x 21" l

Weight

28 lbs.

Note: Model 520P includes High Voltage Power Supply.

Model 500 PRINTER*

The Model 500 Printer records address and arithmetic data from a Series 400 Analyzer on paper tape. This high-speed device makes it possible to print out 400 channels of data in approximately 80 seconds.

A typical line of information includes a one-to-three digit address number, a space, and arithmetic information up to six figures. Suppression of insignificant "zeros" enables the "peak" area of data to be easily located.

SPECIFICATIONS

Print Rate — 5 lines per second.

Data Entry — Parallel BCD.

Data Presentation — 3 address spaces, 5 or 6 data columns. Insignificant zeros are suppressed.

Line Spacing — Zero, single, or double spaced lines.

Printer Mechanism — Hewlett-Packard H51-565A.

Paper — 3" wide folded or rolled high quality.

Power Requirements — 55 watts at 100, 115, 200, 215, 230 volts, 50 to 60 cps.

Size — 8 $\frac{5}{8}$ " w x 10 $\frac{1}{4}$ " h x 21" l.

Weight — 33 pounds.



MODEL 500P

Model 510

TYPEWRITER DRIVE UNIT

The Model 510 Typewriter Drive Unit accepts serial BCD information from the Series 400 Analyzer and converts it to 10-line form to drive an IBM computer typewriter. A front panel switch permits the selection of single or tab spacing between columns of data. The tab spacing can be preset on the typewriter as desired. The operator will have full use of the typewriter facilities before and after a print-out cycle allowing him to operate it manually to identify tabulated data.

SPECIFICATIONS

Type Rate — 10 characters per second; 400 channels in approximately 4 minutes.

Data Entry — Serial BCD (each BCD entry consisting of 4 coded bits).

Paper Size — Up to 16-inch wide paper.

Power Requirements — 25 watts at 100, 115, 200, 215 or 230 volts, 50-60 cps.

Size — 8 $\frac{5}{8}$ " w x 11" h x 21" l.

Weight — 18 pounds.



MODEL 510P

* Model 500P and 510P includes High Voltage Power Supply.

DATA HANDLING UNITS

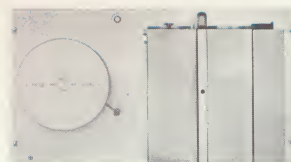
MODEL 530 TYPEWRITER

The Model 530 is an IBM Computer Typewriter that operates in conjunction with a Model 510 or Model 510P Typewriter Drive Unit. When used with these units, the typewriter prints information at the rate of ten characters per second. One line of typing contains the arithmetic contents of ten channels, with or without address identification.



MODEL 540R PAPER TAPE PUNCH

The Model 540R is a Tally 420PR Tape Perforator that is used with the Model 520 Type-Punch-Read Control Unit. Perforating speed is 60 characters per second.



MODELS 550 and 550R PAPER TAPE READERS

The Model 550 is a bench-top Tally 424C Paper Tape Reader. The Model 550R is the Tally 424PR Paper Tape Reader of reel type for panel mounting.

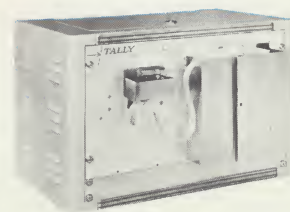
Both models operate with the Model 520 Type-Punch-Read Control Unit at a rate of 60 characters per second.



MODEL 551 PAPER TAPE READER AND PUNCH

The Model 551 is a Tally 1477 Combination Punch and Reader for paper tape. This unit mounts in a single panel and contains no reels.

The Model 551 operates with a Model 520 Type-Punch-Read Control Unit at a rate of 60 characters per second.



ACCESSORY EQUIPMENT

A high voltage supply for scintillation-type detectors can be incorporated in any of the following units: Model 500 Decimal Printer, Model 510 Typewriter Drive Unit and Model 520 Type-Punch-Read Control Unit. A unit with this supply has the suffix "P" after the model number.

The high voltage supply has the following specifications:

Polarity

Positive or negative.

Ranges

750 to 1200 volts in 50-volt steps.

Output Receptacles

4HV BNC connectors Type UG 931/U.

Total Output Current

5 milliamperes maximum continuous duty;
8 milliamperes intermittent duty.

Line Regulation

0.01% for $\pm 10\%$ line voltage variations.

Stability

± 1 part in 10^4 per hour.

Ripple

Less than 15 mv peak to peak at rated output current.

Temperature Coefficient

+0.0025% per degree C. This coefficient makes a first order correction of the negative coefficient of the photo multipliers when both system elements are subjected to the same ambient temperature.

Internal Impedance

Less than 20 ohms.

Voltage Reference

Zener diode.

Voltage Divider

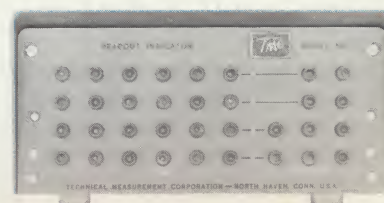
Precision resistors (1% tolerance).

Power Requirements

41 watts at 100, 115, 200, 215, 230 volts,
50-60 cycles.

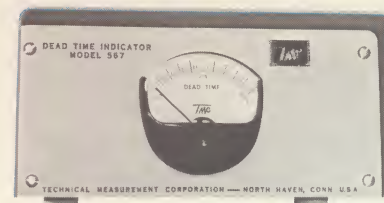
MODEL 561 VISUAL READOUT INDICATOR

The Model 561 contains three columns of four lights each for address information, and six columns of four lights each for arithmetic information. These lights indicate the number of counts stored in any particular channel of the analyzer during readout and testing operations.



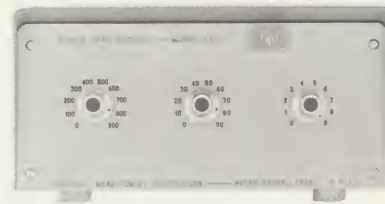
MODEL 567 DEAD TIME METER

The Model 567 Dead Time Meter is used to indicate the percentage of time that a Series 400 Analyzer is busy processing input signal pulses. In experiments where dead time is an important consideration, the Model 567 provides a convenient reference.



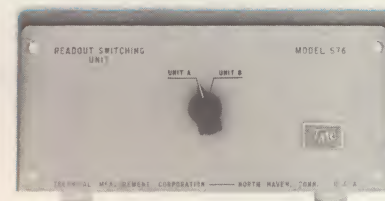
MODEL 575 PUNCH TAPE ENCODER

The Model 575 Punch Tape Encoder is used in conjunction with the TMC Model 520 Type-Punch-Read Control Unit and a Model 400 Series Pulse Height Analyzer. It automatically provides a code number at the beginning of a tape run for identification of that run. It has three controls that "set" the desired code number. The range of the encoder is 0 to 999.



MODEL 576 READOUT SWITCHING UNIT

The Model 576 Accessory allows either of two readout devices to be selected for use with a Series 400 Analyzer. For instance, in a system utilizing both the Model 500 Printer and the Model 520 Type-Punch-Read Control Unit, a printed or punched paper tape readout could be performed without the removal and reconnection of cables.



MODEL 590 PULSER

The Model 590 Pulser is designed to calibrate and test transistorized multi-channel pulse analyzers, such as the TMC Models 401 and 404. Although designed particularly for use with TMC 400-channel pulse analyzers, the Model 590 Pulser is compatible with all other instrumentation where a 0 to 100-mv range applies.



MODEL 570, AND MODEL 570NC X-Y PLOTTERS

The TMC Model 570 is a Moseley 7590B X-Y Plotter which accepts paper up to 11 x 17 inches and is designed to draw cartesian coordinate curves of the accumulated memory contents.

TMC Model 570NC is supplied with a null detector and character printer.

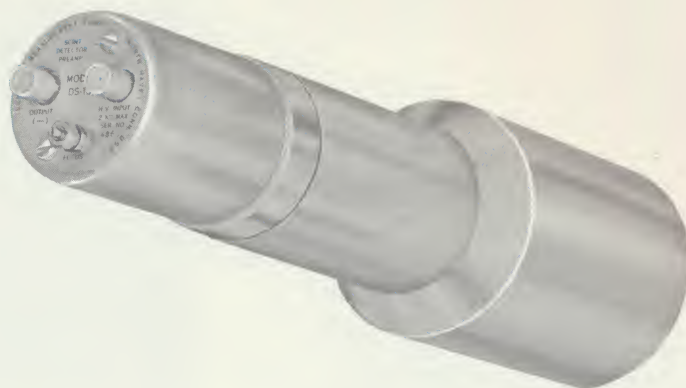


MODEL 302 DELAY LINE UNIT

The Model 302 Delay Line Unit is used to supply a delayed signal for coincidence or anti-coincidence gating of Series 400 Analyzers.

Two, 1-microsecond delay circuits are provided; both may be connected in series for a single, 2-microsecond delay.

MODEL DS-13 SCINTILLATION DETECTOR PREAMPLIFIER



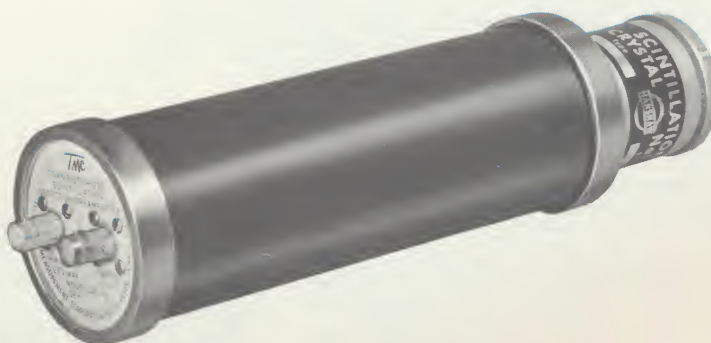
The Model DS-13 Scintillation Detector Preamplifier is a preamplifier and phototube base assembly that can be used with an integral photomultiplier tube scintillator unit to form a complete scintillation detector. A wide range of scintillator units suitable for alpha, beta, or gamma counting is available.

The preamplifier circuit is a cascaded emitter-follower. It obtains its operating voltage from a divider network used to supply appropriate potentials to the photomultiplier tube. A low

output impedance of approximately 100 ohms allows the use of long output signal cables between the preamplifier and pulse-analyzing equipment without excessive signal distortion.

A focus control allows the operator to alter the potential of the internal shield with respect to the photomultiplier tube cathode. This feature is of the utmost value in high-speed coincidence studies or precision pulse height analysis where high spectrum resolution is required.

MODEL DS-12 SCINTILLATION DETECTOR



The Model DS-12 is a complete scintillation detector containing a built-in transistorized preamplifier. This detector features mechanical design that allows quick interchange of a large variety of scintillators.

Preamplifier circuitry of the Model DS-12 is similar to that of the Model DS-13. Low output impedance allows the use of long signal cables without excessive losses or signal distortion.

MODEL 523/2020 MAGNETIC TAPE SYSTEM

The Model 523/2020 Magnetic Tape System combines the TMC Model 523 Magnetic Tape Control Unit with a Datamec Model D-2020 Tape Handler. This enables readout data from the Series 400 Analyzers to be placed on magnetic tape for playback either into a general purpose computer or back into the analyzer itself.

The Magnetic Tape Control provides for Series 400 digital output to be placed on one half inch wide magnetic tape in a BCD format with parity and proper interfile gaps, so as to be IBM compatible. In the Playback mode, data stored on the tape can then be recovered to provide inputs to applicable Series 400 units or external instrumentation.

A search feature is available in the Playback mode of operation. In Record, externally supplied file identification (up to eight tag words) may be written onto the magnetic tape. In Playback, the first recorded tag word may be used as a search word. The search word is selected by positioning a PLAYBACK WORD SELECTOR switch and this results in data following the tag to be read back into the Series 400 analyzer or other appropriate equipment.

SPECIFICATIONS

Modes of Operation — Record and Playback.

Maximum Tag Words — Eight six-character binary coded decimal digits.

Word Time — one millisecond per word.

Tape Speed — 30 inches per second.

Packing Density — 200 bits per inch.

Readout Time — 400 channels in less than 0.5 sec.

Tape Format — BCD code with odd transverse parity and even longitudinal parity.

Power Requirements — 25 watts at 110 or 220 volts, 50-400 cps.

Size — 19" w x 8 $\frac{3}{4}$ " h x 18" d.

Magnetic Tape Control

Datamec Model D-2020 — 19" w x 37" h x 16" d.

Weight — Magnetic Tape Control approximately 25 lbs.

Datamec, Model D-2020 approximately 300 lbs.

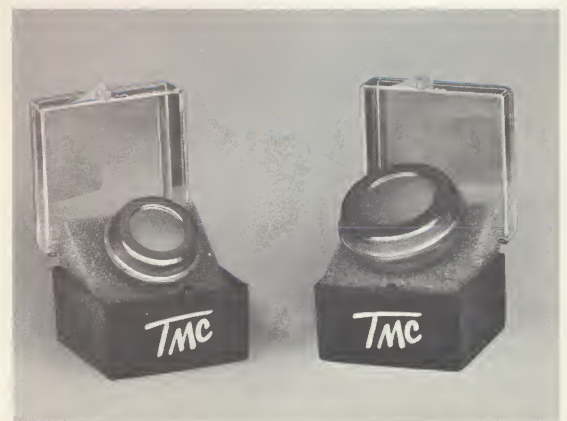


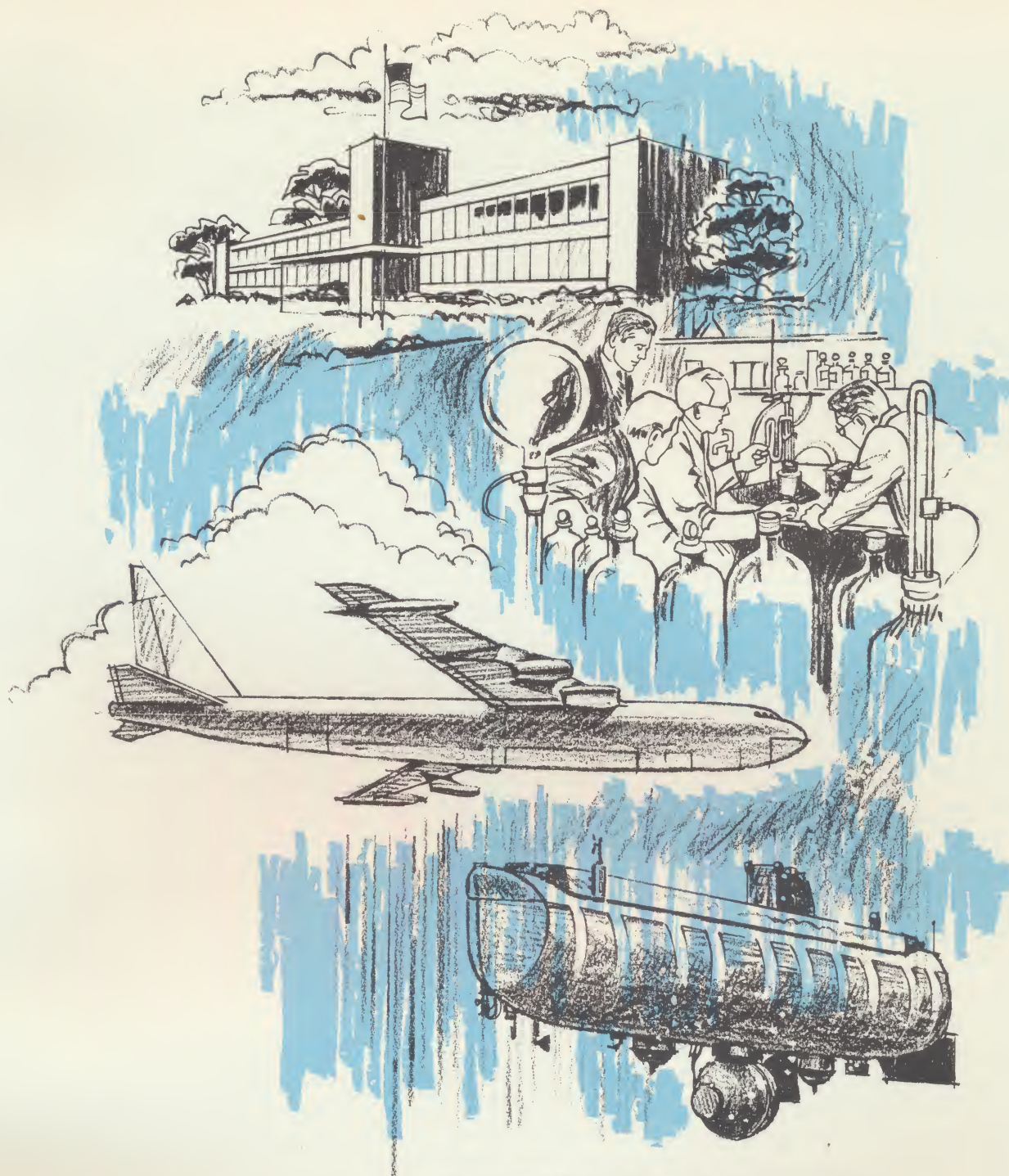
LITHIUM DRIFT SEMICONDUCTOR DETECTORS

Lithium Drift Detectors can be used to detect all types of nuclear radiation. The deep depletion region, together with the thin window of this detector, makes it possible to achieve linear response over a wide energy range. TMC Lithium Drift Detectors are ideal for the detection and the energy spectral analysis of high energy protons, betas, and other charged particles. Gamma rays of low energies can be detected with high resolution but with low efficiency — approximately 1% efficiency per mm. thickness.

These detectors are large area junction diodes consisting of a thin — less than $\frac{1}{2}$ micron — p type layer on a thick region of highly compensated silicon. The two electrical contacts to this diode are made, one to the p type surface through an evaporated gold film approximately 500 angstroms thick, and one through an ohmic contact to the n type silicon on the back surface.

Technical Measurement Corp. offers transmission type detectors for stacked arrays and dE/dx measurements. Detectors can be stacked to form dE/dx by E systems, or onto one another to create a stacked assembly of greater depletion depth than can be obtained with a single detector. Stacked assemblies of transmission type detectors are available.





Series 400 Pulse Height Analyzers and 500 Series Data Processing Units are now being used in many varied fields.

Some of these fields are:

- Nuclear Research
- Medical Research and Diagnosis
- Public Health and Safety
- Agriculture
- Industry
- Education



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Telephone: (703) 533-0373

2157 American Industrial Way
Chamblee, Georgia 30005
Telephone: (404) 457-3141

Meadows Building
Dallas, Texas 75206
Telephone: (214) 361-7139

EUROPE: (Western Europe and United Kingdom)
Technical Measurement Corporation, GmbH

Mainzer Landstrasse 51 (Postfach 9090)
Frankfurt/Main 1, Germany
Telephone: 33-19-49 and 33-18-50
Cable: TMCEUROPA FRANKFURT/MAIN

ISRAEL:

Technical Measurement Corporation
1, King David Boulevard
Tel Aviv, Israel
Telephone: 235755
Cable: TMCISRAEL

CANADA:

Allan Crawford Associates, Ltd.
65 Martin Ross Avenue
Downsview, Ontario
Telephone: (416) 636-4910
6999 Cote des Neiges Road
Montreal, Quebec
Telephone: (514) 739-6776
1479 La Perriere Street
Ottawa, Ontario
Telephone: (613) 725-1288

JAPAN:

Nichimen Company, Ltd.
Central P.O. Box 1136
Tokyo, Japan
Telephone: Tokyo (241) Rep. 7171 (10)

TECHNICAL MEASUREMENT CORPORATION